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Gary M Cohen
Strafford Building Number Three
125 Strafford Avenue Suite 300
Wayne, PA 19087-3318

EXAMINER	
ORTIZ RODRIGUEZ, CARLOS R	
ART UNIT	**PAPER NUMBER**
2123	
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03/30/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,504	BARLIER ET AL.	
	Examiner	Art Unit	
	CARLOS ORTIZ RODRIGUEZ	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/27/2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13,15-19,21-24 and 26-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13,15-19,21-24 and 26-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/07/2010, 1/27/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 13,15-19, 21-24 and 26-37 are pending.

2. Claims 1-12, 14, 20 and 25 are cancelled.

3. Claims 36-37 are new.

Response to Arguments

4. Applicant's arguments filed 01/07/2010 have been considered but are moot in view of the new ground(s) of rejection. Please note that the claim 13 has been amended to incorporate subject matter of former claim 14 and former claim 25 specifying that the "mechanical part" is a “mold”. While incorporating subject matter of former claim 14 and 25, further amendments have been done in order overcome the rejections under 35 U.S.C. 112, second paragraph. These amendments changed the scope of independent claim 13 and provided a better interpretation of the claim language, requiring a new ground of rejection. Additionally, Claim 15 has been amended to incorporate subject matter of former claims 20 and 25 also specifying that the "mechanical part" is a “mold”.

Since the rejection below maintains several rejections that are very similar to those previously presented which have been discussed in Applicant’s Arguments filed 01/07/2010, those specific arguments are addressed below.

Please note that on Page 16 Lines 17-25, Applicant’s Arguments indicate that “Claim 19 is directed to a fluid transport circuit, interior portions of which have a plurality of transverse fins for mechanically reinforcing the fluid *transport* circuit and for stirring

the circulated fluid. No such structure is disclosed by Choi et al. or Shaikh et al., and the fins 11, mounds 12, 14 and stubs 13 disclosed by Sachs et al. do not provide mechanical reinforcement of the channels which incorporate them. As a consequence, such structure is not disclosed by Choi et al., Shaikh et al. or Sachs et al.".

In response to this arguments, note that Sachs teaches these features because Sachs teaches fins for mechanically reinforcing the fluid transport circuit and for stirring the circulated fluid because Sachs teaches using fins for allowing an increase in the channel surface area (see C4 L47-49 and C10 L66).

On Page 17 Lines 6-19 , Applicant's Argument s indicate that "In accordance with the present invention, problems such as excessive thermal inertia of the molds and the uncontrollable influence of external conditions on regulation of the manufactured molds are overcome by combining the fluid transport circuit with an isolating circuit in the form of a three-dimensional network of channels or a layer-shaped chamber, which can be filled by an insulating material, by air, or by a suitable heat transfer fluid. No such structure is disclosed by Choi et al., Shaikh et al. or Sachs et al.".

In response to this argument, note that Sachs teaches these features because Sachs teaches incorporating integral contour coolant channels into the mold, adding surface textures to the coolant channels, creating high thermal conductivity paths between the surfaces and the coolant channels, and creating low thermal inertia regions in the mold (see the Abstract).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically taught or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 13,15-19, 21-24 and 26-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al., "Design and Evaluation of a Laser-Cutting Robot for Laminated, Solid Freeform Fabrication", 2000 IEEE (hereinafter Choi) in view of Shaikh et al. U.S. Patent No. 5,847,958 (hereinafter Shaikh) in view of Sachs et al. U.S. Patent No. 5,775,402 (hereinafter Sachs).

a. **Regarding claim 13**, Choi teaches a method for producing a mechanical part by computer-aided design including a preliminary step in which body portions of the mechanical part are broken down into elementary strata, followed by steps including manufacture of the elementary strata to form manufactured strata and reconstruction of the mechanical part by superposing and assembling the manufactured strata; breaking down the mechanical part into a plurality of elementary chambers as part of the break-down of the mechanical part and during the break-down of the mechanical part; producing elementary chambers in the manufactured strata during the manufacture of the manufactured strata; and

completely reconstructing the mechanical part during the superposition and the assembly of the manufactured strata (Fig 1 and Page 1551, Column 1, 3rd full paragraph).

But Choi fails to clearly specify defining a fluid transport circuit in the mechanical part; breaking down the fluid transport circuit into a plurality of elementary chambers as part of the break-down of the mechanical part and during the break-down of the mechanical part; producing the elementary chambers in the manufactured strata during the manufacture of the manufactured strata; and completely reconstructing the fluid transport circuit during the superposition and the assembly of the manufactured strata; breaking down an isolating circuit coupled with the fluid transport circuit into elementary isolating chambers as part of the break-down of the mold and during the break-down of the mold; producing the elementary isolating chambers in the manufactured strata during the manufacture of the manufactured strata; and reconstructing the isolating circuit during the superposition and the assembly of the manufactured strata. Choi further fails to clearly specify wherein the mechanical part is a mold.

However, Shaikh teaches defining a fluid transport passages in the mechanical part; breaking down the fluid transport passages into a plurality of elementary chambers as part of the break-down of the mechanical part and during the break-down of the mechanical part; producing the elementary chambers in the manufactured strata during the manufacture of the

manufactured strata; and completely reconstructing the fluid transport passages during the superposition and the assembly of the manufactured strata (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 - - see sectioning the graphic member into blocks/slabs; see that physical solid members are carved in a manner that, at the time of putting the blocks/slabs together, create passages/channels/fluid transport circuit).

Choi and Shaikh are analogous art because they are from the same field of endeavor. They both relate to machining three-dimensional objects.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings taught by Choi and combining them with the teachings taught by Shaikh.

One of ordinary skill in the art would have been motivated to do this modification in order to rapidly make part utilizing economical techniques as suggested by Shaikh (C2 L5-10).

But the combination of Choi and Shaikh fails to clearly specify that the fluid transport passages comprise fluid transport circuits and isolating circuits. The combination of Choi and Shaikh further fails to clearly specify wherein the mechanical part is a mold.

However, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport passages which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36- - see the coolant channels and the high thermal conductivity paths).

Choi, Shaikh and Sachs are analogous art because they are from the same field of endeavor. They all relate to machining three-dimensional objects.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings taught by the combination of Choi and Shaikh and combining them with the teachings taught by Sachs.

One of ordinary skill in the art would have been motivated to do this modification in order to increase the overall toughness of the part/tool as suggested by Sachs (see C5 L5-10).

b. **Regarding claim 15**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches a mechanical part including a body having a fluid transport channels comprised of a plurality of channels formed in the body at a predetermined distance from a heat exchange surface associated with the body (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4), wherein the body is completely reconstructed during the assembly of the manufactured strata, and wherein the plurality of elementary chambers are provided in at least one portion of the manufactured strata and are placed in fluid-tight communication (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4).

As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

Sachs further teaches the isolating circuit spaced from and coupled with the fluid transport circuit; and wherein the plurality of elementary isolating chambers are provided in another portion of the manufactured strata and are placed in fluid-tight communication (C4 L30-67, C6 and C11 L10-36).

c. **Regarding claim 16**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches wherein, following reconstruction of the manufactured strata, the fluid transport passages forms a three-dimensional network channels in the body of the mechanical part which follow or copy surface portions of the part at a predetermined distance from the surface portions (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

d. **Regarding claim 17**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches wherein, following reconstruction of the manufactured strata, the fluid transport passages forms a layer-shaped chamber in the body of the mechanical part (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

e. **Regarding claim 18,** the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Sachs further teaches a fluid transport circuit that includes a connection to a temperature regulating device (C14 L6-26).

f. **Regarding claim 19** the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Sachs further teaches wherein interior portions of a fluid transport circuit include a plurality of transverse fins providing mechanical reinforcement and stirring the fluid (C4 L47-49 and C10 L66).

g. **Regarding claim 21**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Sachs further teaches wherein the isolating circuit is comprised of a plurality of parallel channels (Abstract - - see creating high thermal conductivity paths between the surface and the cooling channels).

h. **Regarding claim 22**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Sachs further teaches wherein the isolating circuit forms a layer-shaped chamber (Fig 8 and C11 L10-36).

i. **Regarding claim 23**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

A mechanical adhesive between the elementary strata on regions of the body extending from the channels to outside portions of the mechanical part, and an adhesive with a predetermined thermal conductivity on regions of the body extending from the fluid transport passages to surface portions of the body is inherent to the system taught by Shaikh (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

j. **Regarding claim 24**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches wherein the fluid transport passages are filled with a fluid selected from the group consisting of a heat exchange fluid, a thermal insulation fluid, a liquid material, a pulverulent material and a marking fluid (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 - - see the intake and exhuast). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

k. **Regarding claim 26**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches that the elementary chambers are produced in the manufactured strata before the manufactured strata are reconstructed to form the fluid transport passages (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

l. **Regarding claim 27**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches combining the elementary chambers of the fluid transport passages to form a cooling circuit in the body of the mechanical part (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated

above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

m. **Regarding claim 28**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches combining the elementary chambers of the fluid transport passages to form a three-dimensional network of channels in the body of the mechanical part (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

n. **Regarding claim 29**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches combining the elementary chambers of the fluid transport passages to form a layer-shaped chamber in the body of the mechanical part (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

o. **Regarding claim 30**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches wherein the step of producing the elementary chambers in the manufactured strata further includes the step of forming the elementary chambers in surface portions of the manufactured strata, to a depth which is less than a defined thickness of the manufactured strata is inherent to the system taught by Shaikh (C3 L39-60, C4 L25-38, C5 L9-33 and Claim 13 - - see that the depth of the chambers are limited to a depth less than the thickness of the block/slab).

p. **Regarding claim 31**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches the step of combining the elementary chambers of the fluid transport passages with surface portions of adjacent manufactured strata, to form the fluid transport passages (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

q. **Regarding claim 32,** the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh teaches combining elementary chambers (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). Sachs teaches a thermal barrier between the fluid transport passages and side and bottom portions of the mechanical part (Abstract). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

r. **Regarding claim 33**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Sachs further teaches forming a thermal barrier as a continuous thermal barrier (Abstract).

s. **Regarding claim 34**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh teaches, combining the elementary chambers of the fluid transport passages to form a network of follower channels in the body of the mechanical part (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

t. **Regarding claim 35**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh teaches combining the elementary chambers of the fluid transport passages to form a layer-shaped chamber in the body of the mechanical part (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

u. **Regarding claim 36**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh teaches producing elementary chambers during the manufacture of the manufactured strata (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

v. **Regarding claim 37**, the combination of Choi, Shaikh and Sachs teaches all the limitations of the base claims as outlined above.

Shaikh further teaches simultaneously producing elementary chambers (Abstract, Fig 1, Fig 5 and Fig 6, C3 L5-67, C4 and C5 L63-67). As indicated above, Sachs teaches a mechanical part that is a mold (Abstract) including fluid

transport channels which comprise fluid transport circuits and isolating circuits (C4 L30-67, C6 and C11 L10-36).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Ortiz-Rodriguez whose telephone number is 571-272-3766. The examiner can normally be reached on Mon-Fri 10:00 am- 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Carlos Ortiz-Rodriguez
Patent Examiner
Art Unit 2123

March 31, 2010

/Paul L Rodriguez/
Supervisory Patent Examiner, Art Unit 2123